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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/664,991	09/18/2000	Stephen R. Schwartz	1538/22	4596

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EXAMINER	
PENDLETON, BRIAN T	

ART UNIT	PAPER NUMBER
2644	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/664,991	SCHWARTZ, STEPHEN R.
	Examiner	Art Unit
	Brian T. Pendleton	2644

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 September 2000*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 September 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bartlett, "Tonal Effects of Close Microphone Placement". Bartlett discloses a method for altering the sound of a close miked acoustic instrument (e.g. guitar, piano) to make it sound more natural. The method consists of playing sounds from the instrument when said instrument is closely miked (figure 2) and comparing the spectra of the picked up sound to reference sounds. The reference sounds are the sounds generated by the instrument and heard 1 meter away. These sounds were determined to have well-balanced timbre. See figure 1. The difference between the closely miked and reference sounds are shown in figure 4 (and figures 5-15 for various microphone positions). Therefore, differences in level over the audible frequency range were determined. As taught in section 2, to make the instrument sound "well balanced" when miked up close, the instrument can be equalized. Also in section 5, it was suggested that the inverse of the spectral curve shown in the figures is the equalization required to make a close-mike instrument sound as it does at the reference point (1 meter away). Thus, steps 1 through 4 are taught by Bartlett: a first microphone is placed at a selected location proximate to an acoustic musical instrument (figure 2), sounds are generated by the instrument and picked up by the

microphone, reference sounds of the acoustic generator are played (figure 1) and the sounds picked up by the microphone in figure 2 are compared to the reference sounds (figure 4). Differences in level over the audible frequency range was determined for the sound picked up by the microphone in figure 2 and the reference sounds (also in figure 4). Bartlett does not explicitly disclose designing a tailor-made equalizer for the first microphone to compensate for the differences between the sounds as picked up by the microphone and the reference sounds of the instrument. However, it would have been obvious to one of ordinary skill in the art at the time of invention to design an equalizer for the musical instrument using the inverse spectral curves for the purpose of equating the sound picked up by a microphone to an ideal sound heard 1 meter away, thus reproducing a more pleasant sounding miked instrument. Bartlett suggested that the inverse of the spectral curves shown in figures 4-15 is the equalization needed to make a closely miked instrument sound like the reference sounds. For one of ordinary skill in the art, it was well known that the inverse of the curves can be realized by using an equalizer. An equalizer adjusts the gains in discrete frequency ranges so that an output signal can be shaped according to a specific spectral function. Per claim 2, it was notoriously well known at the time of invention to compare signals with a computer, as its use improved speed and accuracy. As to claim 3, Bartlett suggests a plurality of test positions of the closely miked guitar. Without undue experimentation, one of ordinary skill in the art would have attached the microphone to the instrument, as was done for acoustical performances at the time of invention. Regarding claims 4 and 5, section 3 of Bartlett discloses that musicians and audio engineers were asked to describe the differences between the closely miked instrument and the reference sound for the test positions. Their comments are shown next to the difference curves in the figures. Thus, it was

taught that the naked ear could be used to compare the sounds picked up by the microphone and the reference sounds. As a result, the listener could then manipulate a graphic equalizer to make up for the difference in sounds. Per claim 6, Bartlett runs his experiment with different embodiments of an acoustic guitar. Regarding claim 7, Figure 1 of Bartlett discloses that a reference second microphone to pick up the reference sounds of an acoustic instrument. It would have been obvious to compare recordings from the first and second microphones to determine the audio differences between the records and design an appropriate equalizer for the first microphone proximate the instrument. One of ordinary skill in the art would have realized that recordings of the microphone signals could be made and compared to generate the difference level curves shown in the figures without undue experimentation. Per claim 8, it was notoriously well known at the time of invention to compare signals with a computer, as its use improved speed and accuracy. As to claim 9, Bartlett suggests a plurality of test positions of the closely miked guitar. Without undue experimentation, one of ordinary skill in the art would have attached the microphone to the instrument, as was done for acoustical performances at the time of invention. Per claims 10 and 11, the listening site is 1 meter away, as disclosed on page 727, which is an optimal location for sound quality of a guitar. Per claim 12, Bartlett runs his experiment with different embodiments of an acoustic guitar. As to claim 13, it was obvious to record audio on multi-track media. Per claim 14, within the scope of the Bartlett, it would have been obvious to display and analyze acoustic waveforms for equalization.

Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bartlett in view of Murayama et al, US Patent 6,141,425. Bartlett discloses a method for altering the sound of a close miked acoustic instrument (e.g. guitar, piano) to make it sound more natural.

The method consists of playing sounds from the instrument when said instrument is closely miked (figure 2) and comparing the spectra of the picked up sound to reference sounds. The reference sounds are the sounds generated by the instrument and heard 1 meter away. These sounds were determined to have well-balanced timbre. See figure 1. The difference between the closely miked and reference sounds are shown in figure 4 (and figures 5-15 for various microphone positions). Therefore, differences in level over the audible frequency range were determined. As taught in section 2, to make the instrument sound "well balanced" when miked up close, the instrument can be equalized. Also in section 5, it was suggested that the inverse of the spectral curve shown in the figures is the equalization required to make a close-mike instrument sound as it does at the reference point (1 meter away). Thus, steps 1 through 6 are taught by Bartlett: a selected location proximate to an acoustical generator is determined and a microphone is placed at the location (figure 2), sounds are generated by the acoustical generator and picked up by the microphone, reference sounds of the acoustic generator are played (figure 1) and the sounds picked up by the microphone in figure 2 is compared to the reference sounds (figure 4). Differences in level over the audible frequency range was determined for the sound picked up by the microphone in figure 2 and the reference sounds (also in figure 4). Bartlett does not explicitly state assembling a first filter element for compensating for a first difference in the sounds in a first discrete frequency range and assembling a second filter element for compensating for a second difference in the sounds in a second discrete frequency range and constructing an equalizer using the first and second filter elements, per claim 1. However, those method steps were obvious to one of ordinary skill in the art at the time of invention according to the following explanation.

Bartlett suggests that the inverse of the spectral curves shown in figures 4-15 is the equalization needed to make a closely miked instrument sound like the reference sounds. For one of ordinary skill in the art, it was well known that the inverse of the curves can be realized by using an equalizer. An equalizer adjusts the gains in discrete frequency ranges so that an output signal can be shaped according to a specific spectral function. As evidence, see Murayama et al, columns 1 and 2. Murayama et al state that for adjusting the sound quality of an audio signal depending on the playback sound field, a graphic equalizer circuit for splitting the frequency spectrum into plural bands and for changing the gain in each of the split bands is used extensively. Accordingly, with this teaching, which demonstrated a well known practice in the art, one would have been motivated to use a graphic equalizer to correct for the differences in the closely miked sounds and reference sounds. Although Bartlett proposed a low pass filter with a cut-off frequency around 300 Hz as a compensator in figure 16, that was just one example. As one of ordinary skill in the art could see, figure 16 only compensates for the sound below 300 Hz. The sound above that cut-off level still is not compensated for. An inverse curve is not used, thereby yielding some lingering differences in the mid-range and treble ranges. It would have been obvious at the time of invention to also include those frequency ranges in the compensation process to yield the sound closest to the reference sound. Naturally, one of ordinary skill would not only compensate in one frequency range. For instance, a piano contains a plurality of keys, to compensate for only one of those keys would not produce the reference sound or any sound close to it. Therefore, to have a true reference sound produced from the closely miked instrument, more than one frequency range had to be considered. As shown in Murayama et al, figures 2 and 3, the graphic equalizer has a plurality of frequency ranges, some

of which are discrete from one another (e.g. ranges centered around f_1 and f_3). The bandpass filters 31A, 31B, etc. determine the center frequency and the voltage-current converters, elements 32 and 33, determine the gain. Applying the teachings of Murayama et al, per equalizers and sound adjustment, to the Bartlett reference, it would have been obvious to one of ordinary skill in the art at the time of invention to use the graphic equalizer of Murayama et al, which disclose first and second filter elements with first and second discrete frequency ranges, to achieve the inverse spectral curve of the differences between the sounds of the closely miked acoustical generator and the reference sounds. Claim 15 is met. As to claim 16, Bartlett suggests a plurality of test positions of the closely miked guitar. Without undue experimentation, one of ordinary skill in the art would have attached the microphone to the instrument, as was done for acoustical performances at the time of invention.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian T. Pendleton whose telephone number is (703) 305-9509. The examiner can normally be reached on M-F 7-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on (703) 305-4040. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Brian T. Pendleton
Examiner
Art Unit 2644

btp